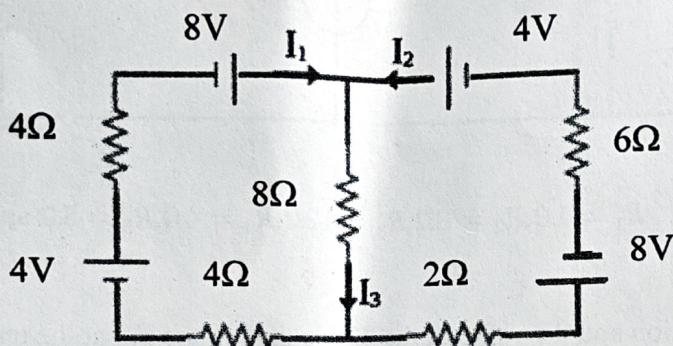


Final Exam

Exercise 1 (6 points):

Calculate the currents I_1 , I_2 and I_3 in the circuit below



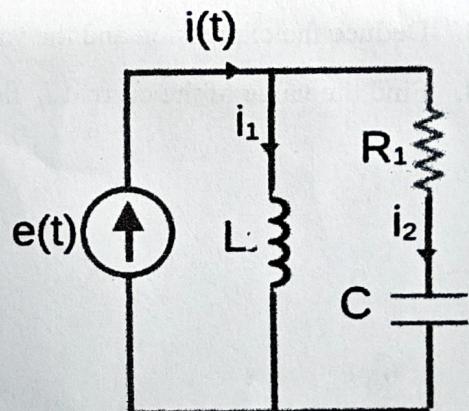
Exercise 2 (6 points):

Consider the electric circuit shown in the following figure.

Where:

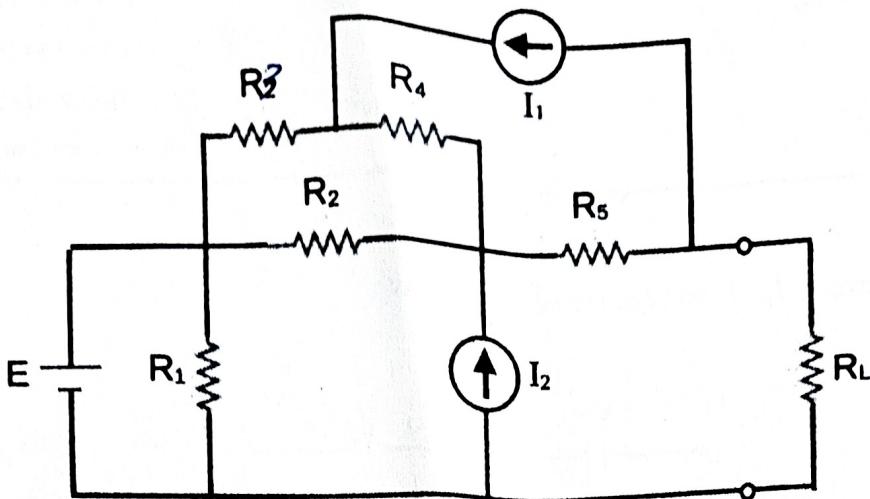
$$e(t) = 25.46 \cos(\omega t); L\omega = 200\Omega; R_1 = 100\Omega; C\omega = 0.01\Omega^{-1}$$

- Calculate the equivalent impedance of the circuit.
- Determine the RMS value and the phase shift, with respect to the voltage $e(t)$ and the current $i(t)$.
- Calculate the electric currents i_1 , and i_2 , specifying for each one its RMS value and its phase at the origin (initial phase).



Exercise 3 (8 points):

Consider the electric circuit shown in the figure, below with:



$$E = 100V, I_1 = 2A, I_2 = 2A, R_1 = 1\Omega, R_2 = 8\Omega, R_3 = 12\Omega, R_4 = 4\Omega, R_5 = 5\Omega, \text{and } R_L = 100\Omega.$$

1. Determine the expression and the value of the Thévenin voltage V_{th} at the terminals of R_L using the superposition theorem.
2. Determine the expression and the value of the Thévenin resistance R_{th} seen from the terminals of R_L .
3. Deduce the expression and the value of the Norton current I_N .
4. Find the value of the current I_L flowing through the resistor R_L .

Good luck